

# USER'S MANUAL

**VUT 160 V EC A11**  
**VUT 350 VB EC A11**  
**VUT 550 VB EC A11**



## HEAT RECOVERY AIR HANDLING UNIT



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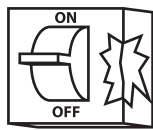

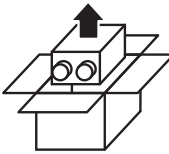

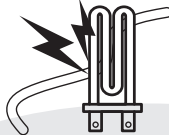
## SAFETY REQUIREMENTS

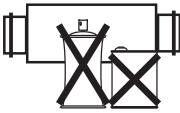


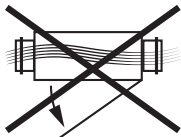
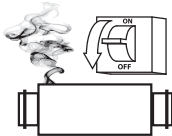
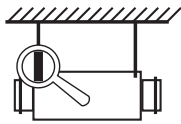
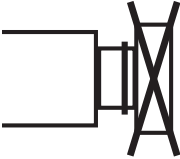

- Read the user's manual carefully prior to the operation and installation of the VUT ... VB EC A11 or VUT ... V EC A11 heat recovery air handling units.
- Fulfil the operation manual requirements as well as the provisions of all the applicable local and national construction, electrical and technical codes and standards.
- The warnings contained in the user's manual must be considered most seriously since they contain vital personal safety information.
- Failure to follow the safety requirements may result in an injury or unit damage.
- Read the manual carefully and keep it as long as you use the unit.
- While transferring the unit control the user's manual must be turned over to the receiving operator.

Symbol legend used in the manual:

	<b>WARNING!</b>
	<b>DO NOT!</b>

## UNIT MOUNTING AND OPERATION SAFETY PRECAUTIONS

	The unit must be disconnected from power supply prior to any installation or repair operations.		The unit must be grounded!
	The unit must not be operated outside the temperature range stated in the user's manual and in aggressive or explosive environments.		Do not use damaged equipment or conductors to connect the unit to power mains.
	While installing the unit follow the safety regulations specific to the use of electric tools.		Unpack the unit with care.
	Do not change the power cable length at your own discretion. Do not bend the power cable. Avoid damaging of the power cable.		Do not position any heating devices or other equipment in close proximity to the unit power cable.

	Do not touch the unit controls with wet hands. Do not carry out the unit maintenance with wet hands.		Use the unit only as intended by the manufacturer. Do not connect a clothes dryer or other similar equipment to the unit or the ventilation system.
	Do not wash the unit with water. Protect the unit electric parts from water ingress.		Do not put any water containers on the unit, i.e. flower vases.
	Keep combustible gases and inflammable products away from the unit.		Disconnect the unit from power supply prior to maintenance.
	Do not let children operate the unit.		Do not damage the power cable while operating the unit. Do not put any objects on the power cable.
	Do not sit on the unit and do not put any objects on it.		Do not open the operating unit.
	In case of unusual sounds, smell of smoke disconnect the unit from power supply and contact the service centre.		During a long-term operation of the unit periodically check the mounting for reliability.
	Do not block the air duct when the unit is on.		Do not let air flow from the unit be directed to the open flame devices or candles.

## ■ INTRODUCTION

This user's manual includes technical description, operation, installation and mounting guidelines, technical data for the VUTVB EC A11 and VUTV EC A11 heat recovery air handling units, hereinafter referred as the unit.

## ■ USE

The unit is an energy saving unit based on heat recovery technology and is one of the energy saving components used in the buildings and premises. The unit is a component part and is not designed for stand-alone operation.

The unit is designed to provide permanent controlled air exchange by means of mechanical ventilation in houses, offices, hotels, cafés, meeting halls and other mechanically ventilated premises as well as utilization of extract air heat energy to warm up supply purified air.

Transported air must not contain any flammable or explosive mixtures, evaporation of chemicals, coarse dust, soot and oil particles, sticky substances, fibrous materials, pathogens or any other harmful substances.

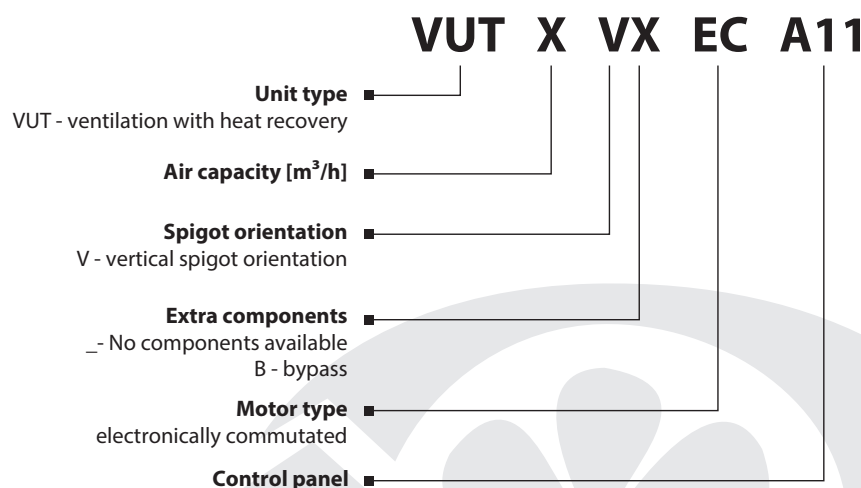


**THE UNIT IS NOT INTENDED TO BE USED BY CHILDREN, PHYSICALLY OR MENTALLY DISABLED PERSONS, PERSONS WITH SENSORY DISORDER, PERSONS WITH NO APPROPRIATE QUALIFICATION. ALL OPERATIONS WITH THE UNIT MUST BE PERFORMED ONLY BY PROPERLY QUALIFIED PERSONNEL AFTER THE APPROPRIATE SAFETY BRIEFING. THE UNIT INSTALLATION SITES MUST PREVENT ACCESS BY UNATTENDED CHILDREN.**

## ■ DELIVERY SET

■ Unit	1 item
■ User's manual	1 item
■ Control panel user's manual	1 item
■ Control panel	1 item
■ Outdoor temperature sensor	1 item
■ Drain pipe	1 item
■ Packing box	

## ■ DESIGNATION KEY



## ■ TECHNICAL DATA

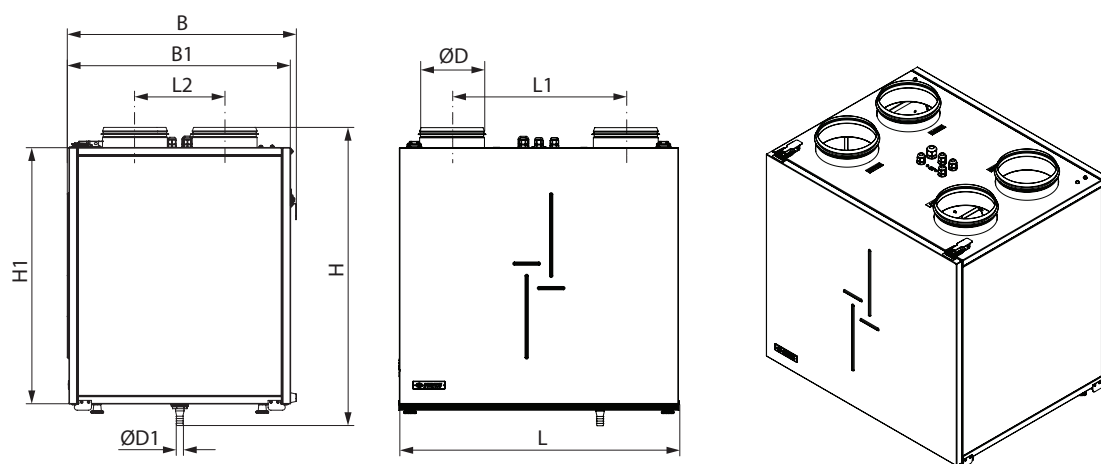
The unit is designed for indoor application with the ambient temperature ranging from +1°C up to +40°C and relative humidity up to 80 %.

Hazardous parts access and water ingress protection rating:

- IP 44 for the unit motors;
- IP 22 for the assembled unit connected to the air ducts.

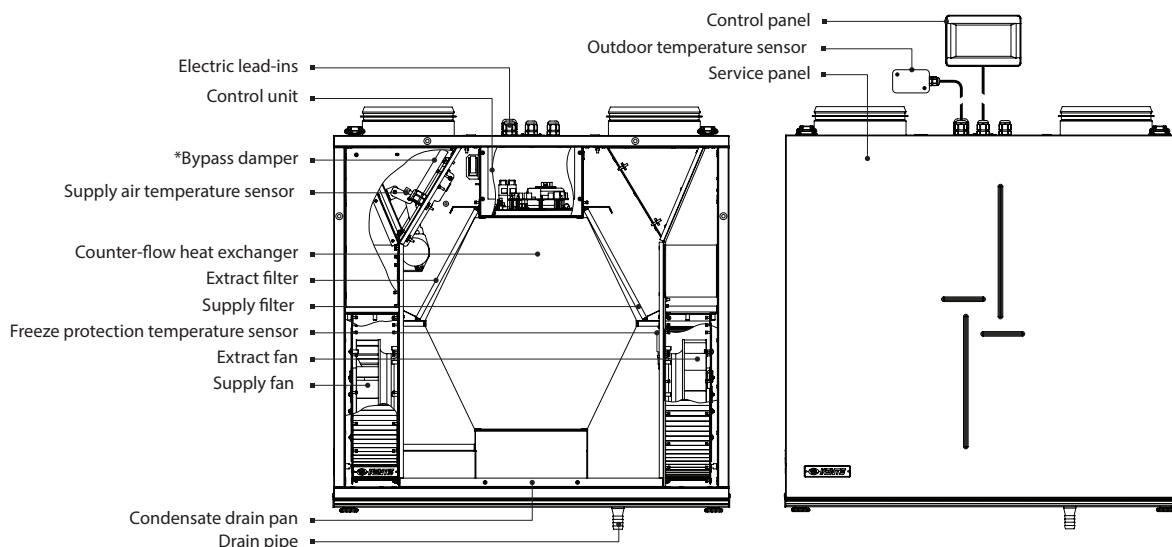
The unit design is regularly improved, so some models can slightly differ from those ones described in this manual.

Model	VUT 160 V EC A11	VUT 350 VB EC A11	VUT 550 VB EC A11
Unit voltage [V / 50-60 Hz]	1~ 230		
Max. unit power [W]	51	166	333
Max. unit current [A]	0,4	1,3	2,3
Max. air capacity [m³/h]	180	415	700
RPM	3770	3200	3230
Sound pressure level at 3 m distance [dB(A)]	44	51	55
Transported air temperature [°C]	from -25 up to +60 °C		
Casing material	painted steel		
Insulation	20 mm mineral wool	40 mm mineral wool	40 mm mineral wool
Extract filter	G4 (optional F7)		
Supply filter	G4 (optional F7)		
Connected air duct diameter [mm]	Ø125	Ø160	Ø200
Weight [kg]	34	61	70
Heat recovery efficiency [%]	from 88 up to 98	from 85 up to 98	from 81 up to 97
Heat exchanger type	counter-flow		
Heat exchanger material	polystyrene		



Model	Dimensions [mm]								
	ØD	ØD1	B	B1	H	H1	L	L1	L2
VUT 160 V EC A11	125	18	348	330	650	550	600	388	143
VUT 350 VB EC A11	160	18	610	592	758	675	734	426	230
VUT 550 VB EC A11	200	18	741	722	758	675	825	493	284

## UNIT DESIGN AND OPERATING LOGIC



The service panel is installed at the side of the unit for repair and maintenance operations. The control unit with a hinged electrical mounting plate is positioned in the upper part of the unit casing. The power cable and grounding cable are connected to the control unit via the electric lead-ins. The difference between the supply and extract air flow temperature leads to condensate generation. Condensate is collected in the drain pan and is removed outside through the drain pipe.

At the request of the customer the unit can be equipped with a humidity sensor. The humidity sensor is purchased separately as an accessory. The unit with the installed humidity sensor maintains a set indoor humidity point. As the extract air humidity rises above the set point, the system automatically switches to the maximum speed. As the humidity drops down below the set point the unit returns to the previous mode. Installation and connection of the humidity sensor is carried out on site by the service technician.

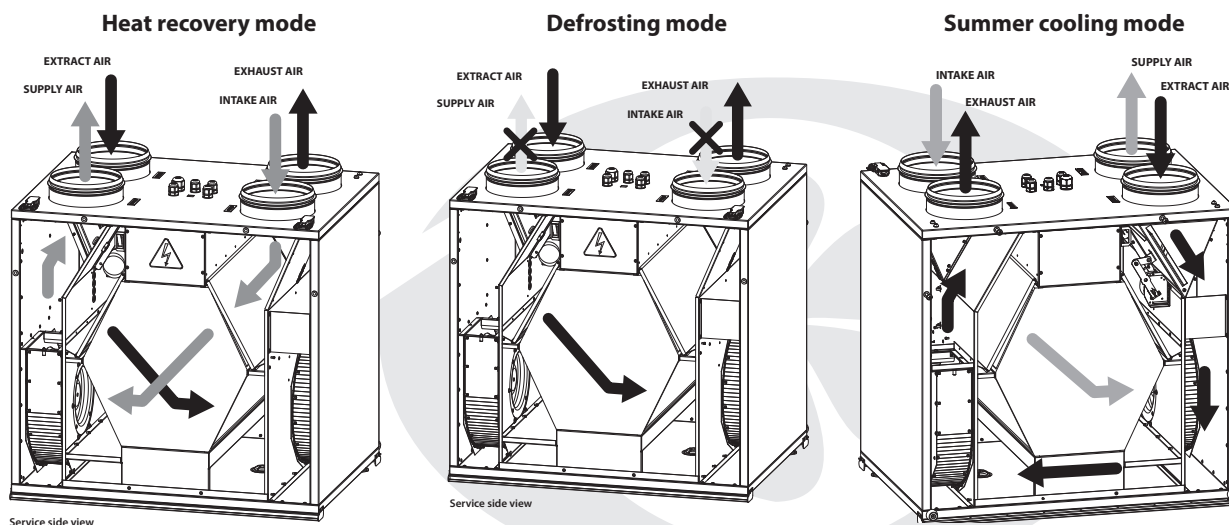
**\* The following units incorporate a bypass damper: VUT 350 VB EC A11 and VUT 550 VB EC A11.**

### UNIT OPERATION MODES

**Heat recovery mode:** warm extract air from the room flows into the unit and is cleaned in the extract filter. Then the air is moved through the heat exchanger and is exhausted outside with the extract fan. Cold fresh air from outside flows into the unit, where it is cleaned in the supply filter. Then the air flows through the heat exchanger and is moved to the room with the supply fan. Supply air is heated in the heat exchanger by transferring the heat energy of warm and humid extract air to the cold fresh air. The air flows are fully separated while flowing through the heat exchanger. Heat recovery minimizes heat losses, which reduces the cost of space heating in the cold season.

**Defrosting mode:** to prevent the heat exchanger freezing in the cold season the unit has an automatic defrosting mode according to the freeze protection temperature sensor readings in the exhaust air duct downstream of the heat exchanger. The unit switches to the defrosting mode at the extract air temperature  $+3^{\circ}\text{C}$ . As the temperature rises the unit returns to the previous mode. Only the extract fan operates in the defrosting mode, the supply fan is switched off.

**Summer cooling mode:** the bypass damper is opened, the extract air that is removed from the premises bypasses the heat exchanger. The intake air temperature remains constant.



## ■ MOUNTING AND SET-UP

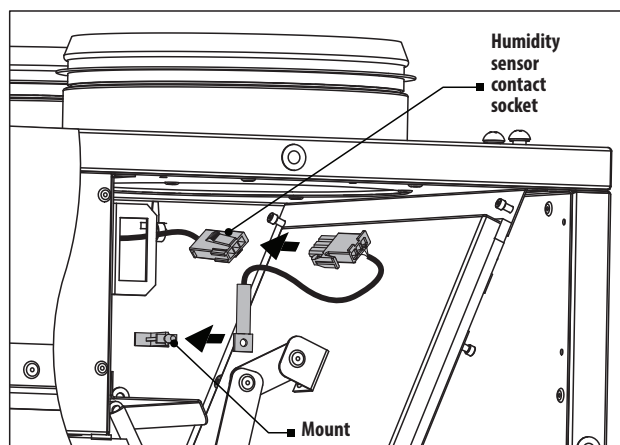
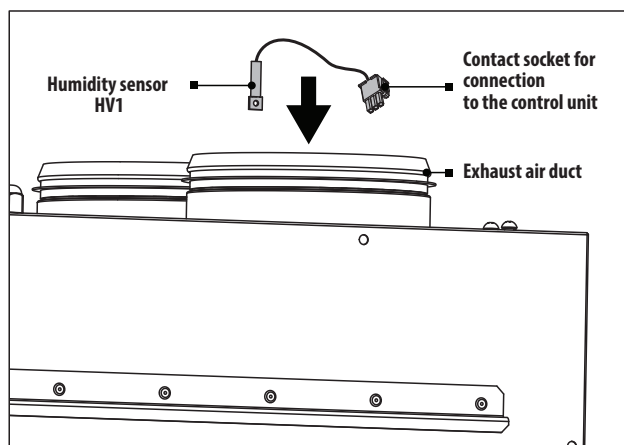


**THE UNIT MUST BE MOUNTED BY A QUALIFIED EXPERT ONLY, PROPERLY TRAINED AND HAVING THE REQUIRED TOOLS AND MATERIALS.**

### ■ HV1 HUMIDITY SENSOR MOUNTING

The HV1 humidity sensor is not included into delivery set and should be ordered separately. The humidity sensor must be installed prior to unit mounting.

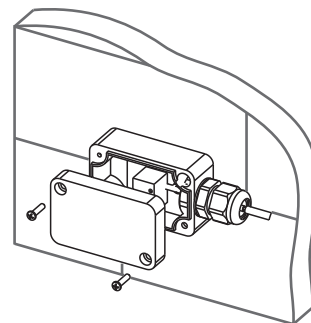
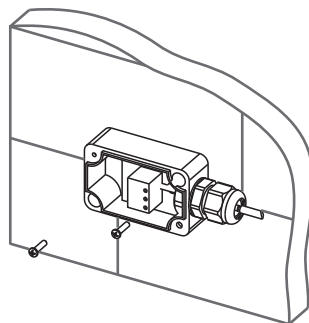
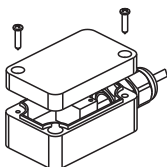
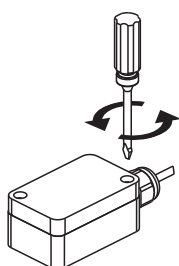
Install the humidity sensor through the extract spigot into the mount on the extract air duct panel and connect the humidity sensor contact socket to the respective contact socket on the control unit, refer the wiring diagram.



### ■ THE OUTDOOR TEMPERATURE SENSOR MOUNTING

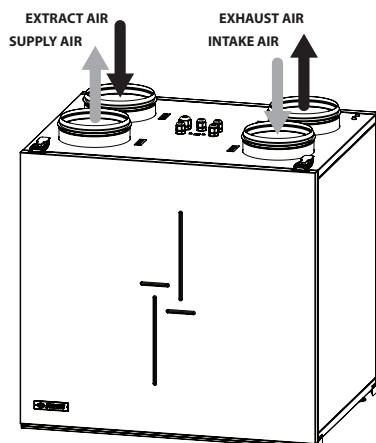
The outdoor temperature sensor must be installed away from interference sources, such as direct sunlight, draughts, etc.

1. Remove two screws that retain the sensor cover.
2. Take off the sensor cover.
3. Install the sensor on the outer wall.
4. Install the sensor cover back.

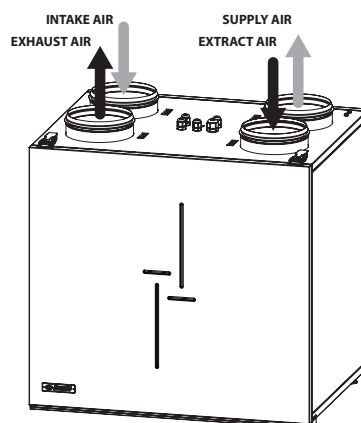


### ■ SERVICE SIDE CHANGE

Make sure of the correct unit service side selection. Unit mounting position should enable free excess to the service panel for maintenance and service operations.



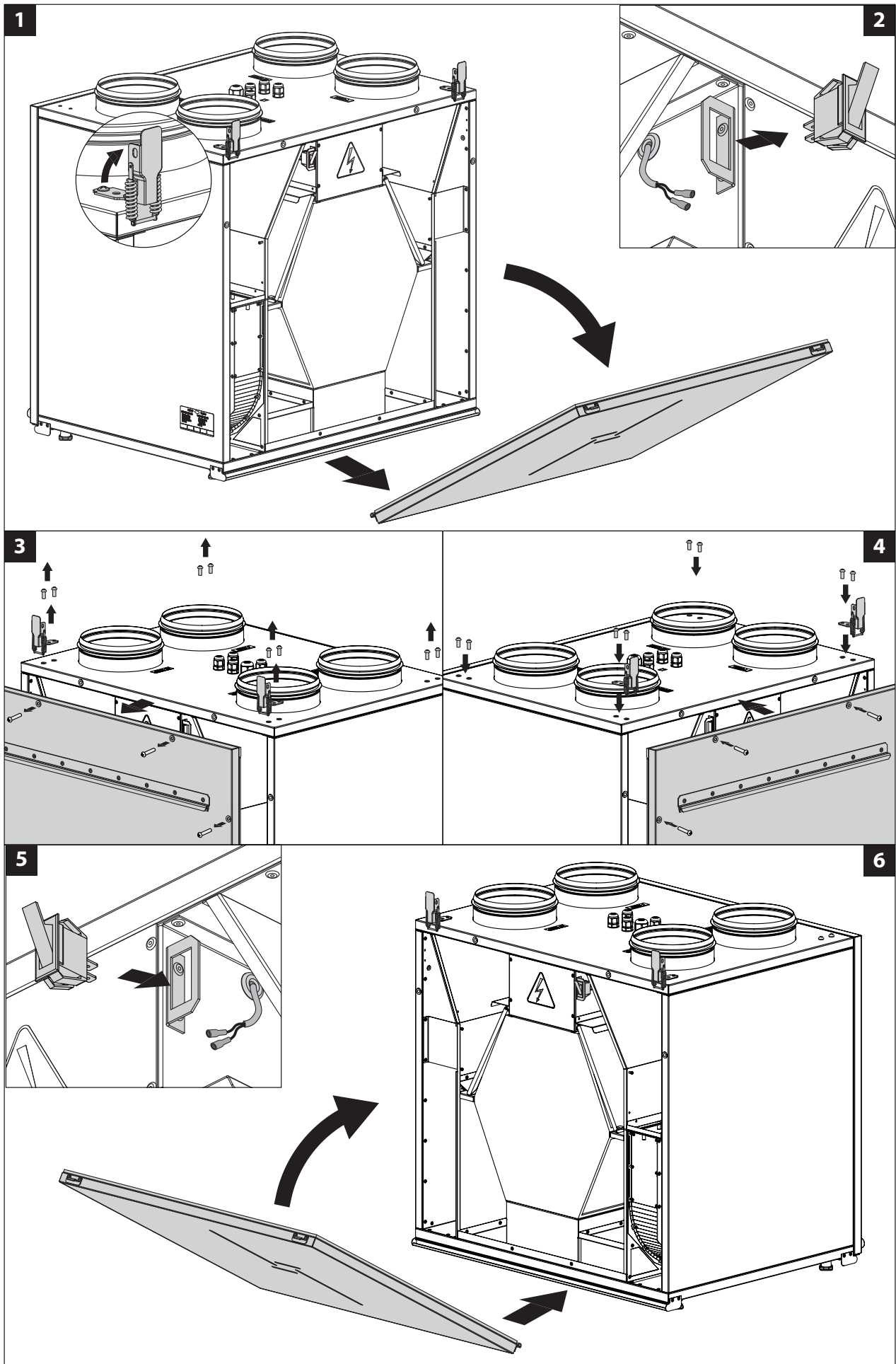
Left-handed modification



Right-handed modification



Service side change for unit mounting:



## ■ UNIT MOUNTING

To attain the best performance of the unit and to minimise turbulence-induced air pressure losses while mounting connect the straight air duct section to the spigots on both sides of the unit.

Minimum straight air duct length:

- equal to 1 air duct diameter on intake side.
- equal to 3 air duct diameters on outlet side.

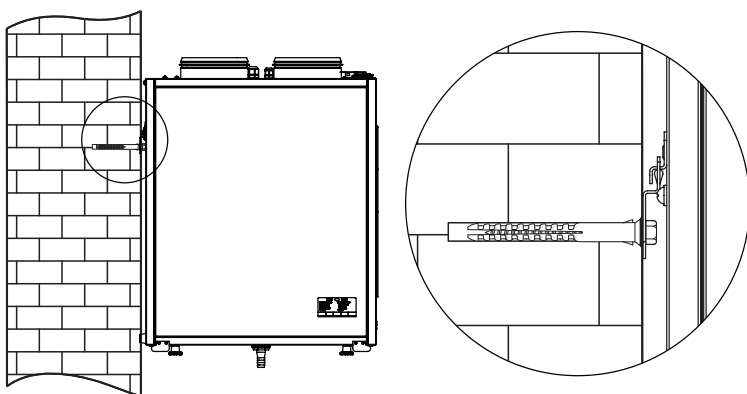
If the air ducts are not connected or the connected air ducts are too short, protect the unit parts from ingress of foreign objects by covering the spigots with a protecting grille or other protecting device with mesh width not more than 12.5 mm to prevent uncontrollable access to the fans.

While installing the unit ensure convenient access for subsequent maintenance and repair. The unit must be mounted on a plane wall. Mounting the unit to an uneven surface can lead to the unit casing distortion and operation disturbance.

### Unit wall mounting.

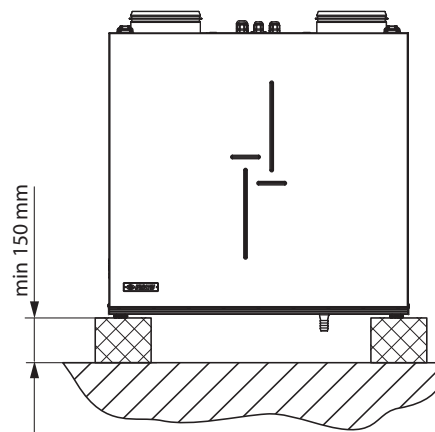
Fasteners for wall-mounting are not included into delivery set and should be ordered separately. While choosing fasteners consider the material of the mounting surface as well as the weight of the unit, refer Technical Data. Fasteners for unit mounting should be selected by Customer Service technician.

Fix the wall-mounted hook at the appropriate level and fix the unit on the hook.



### Unit floor mounting.

Install the unit on the preset floor supports, minimum 150 mm height, to ensure sufficient access for the drain pipe connection to the U-trap and for condensate drain system mounting.



## ■ WALL-MOUNTED CONTROL PANEL INSTALLATION

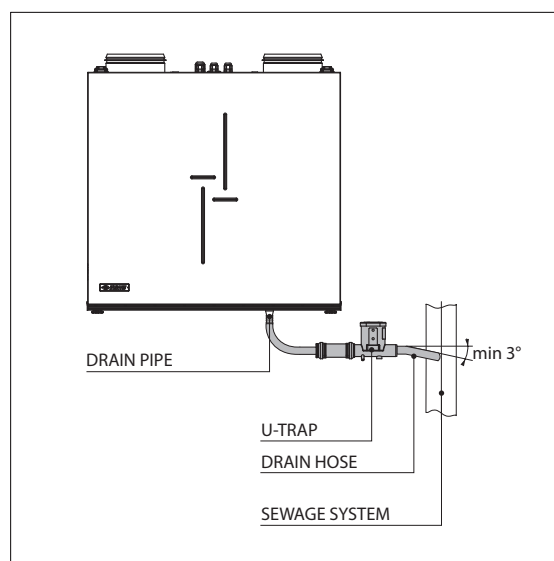
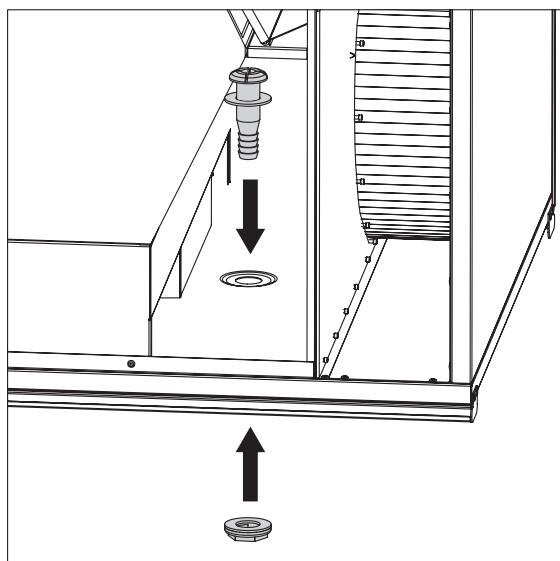
Fixing methods for control panel wall mounting:

- wall surface mounting;
- wall flush mounting.

Example of wall flush mounting using a mounting box is shown in the control panel user's manual. The mounting box and the mounting kit must be purchased separately.

## ■ CONDENSATE DRAINAGE

The hole for the drain pipe is at the bottom of the unit. Remove the plug from the hole, open the service panel and install the drain pipe from the delivery set into the hole, then connect the drain pipe to the sewage system using the SG-32 U-trap kit (available upon separate order). The pipe slope downwards must be at least 3°.



## ■ CONNECTION TO POWER MAINS



**DISCONNECT THE UNIT FROM POWER MAINS PRIOR TO ANY OPERATIONS. THE UNIT MUST BE CONNECTED TO POWER MAINS BY A QUALIFIED ELECTRICIAN. THE RATED ELECTRICAL PARAMETERS OF THE UNIT ARE SHOWN ON THE RATING PLATE.**



**ANY TAMPERING WITH THE INTERNAL CONNECTIONS IS PROHIBITED AND WILL VOID THE WARRANTY.**

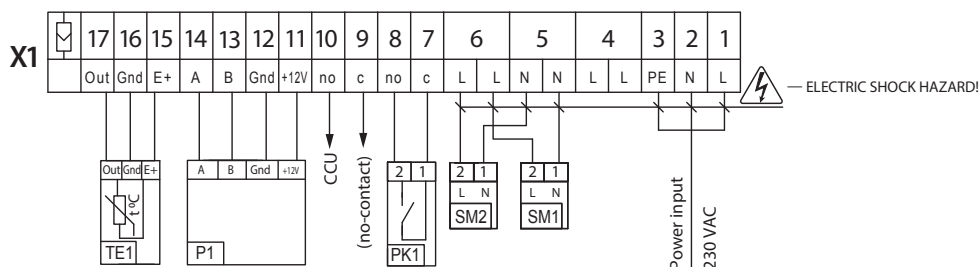
The unit is rated for connection to a single-phase ac 230 V / 50-60 Hz. The unit shall be connected to power supply by means of insulated, durable and thermal-resistant cords (cable, wires) with respective cross section, in any case no less than 1 mm<sup>2</sup>.

Connect the cables to the control unit using the electric lead-ins on the top of h unit.

Connect the unit to power mains through the external automatic circuit breaker with magnetic trip integrated into the fixed wiring system with the rated current not below the rated current consumption. The external circuit breaker position must ensure free access for quick power-off of the unit. The trip current must be not less than the consumption current, refer to Technical data.

Connect the unit to the terminal block X1, located on the hinged panel of the control unit, in compliance with the wiring diagram.

Wiring diagram:



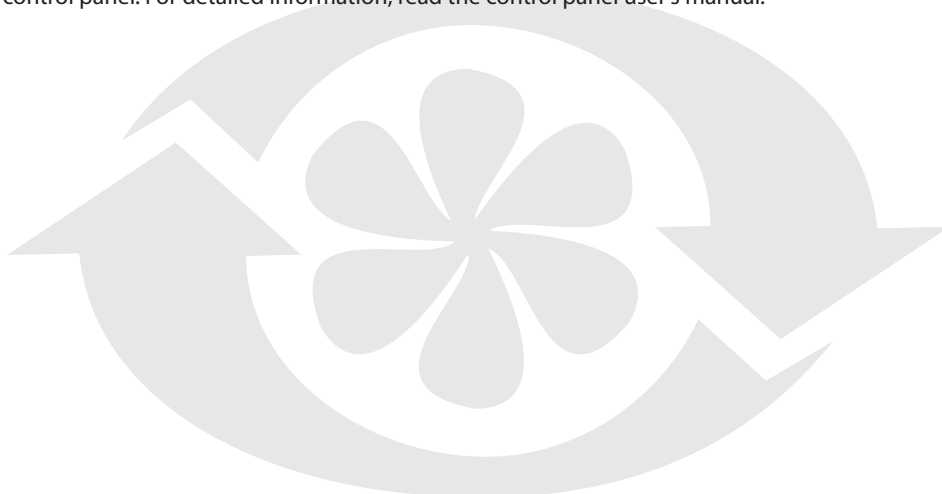
Design.	Name	Type	Wire**
CCU*	DX cooler	N0	2x0,75 mm <sup>2</sup>
SM1*	Supply air damper actuator	1_P 230	2x0,75 mm <sup>2</sup>
SM2*	Extract air damper actuator	1_P 230	2x0,75 mm <sup>2</sup>
PK1*	Contact from fire alarm panel	N0	2x0,75 mm <sup>2</sup>
P1	Control panel		
TE1	Outdoor temperature sensor		

\* is not included into delivery set.

\*\* Maximum connecting cable length is 20 m!

## ■ UNIT CONTROL

The unit is operated with the control panel. For detailed information, read the control panel user's manual.



## ■ MAINTENANCE



**DISCONNECT THE UNIT FROM POWER MAINS PRIOR TO ANY MAINTENANCE OPERATIONS.**

Maintenance operations of the unit are required 3-4 times per year. Maintenance includes regular cleaning and the following operations:

### 1. Filter maintenance (3-4 times per year).

Dirty filters increase air resistance in the system and reduce supply air volume. The filters require cleaning not less than 3-4 times per year. Vacuum cleaning is allowed. After two consecutive cleanings filters must be replaced. Contact the unit Seller to purchase new filters.

### 2. Heat exchanger maintenance (once per year).

Some dust may accumulate on the heat exchanger block even in case of regular maintenance of the filters. To maintain the high heat exchange efficiency, regular cleaning is required. To clean the heat exchanger(s) pull it(them) out of the unit and flush it(them) with warm detergent solution. After cleaning install the dry heat exchanger(s) back to the unit.

### 3. Fan maintenance (once per year).

Even in case of regular maintenance of the filters, some dust may accumulate inside the fans and reduce the fan performance and supply air flow. Clean the fans with a soft brush or cloth. No water and abrasive detergent, sharp objects or solvents are allowed for cleaning to prevent the impeller damage.

### 4. Condensate drainage maintenance (once per year).

The drain pipes may get clogged with the extracted particles. Pour some water inside the drain pan to check the pipe for clogging. Clean the U-trap and the drain pipe if required.

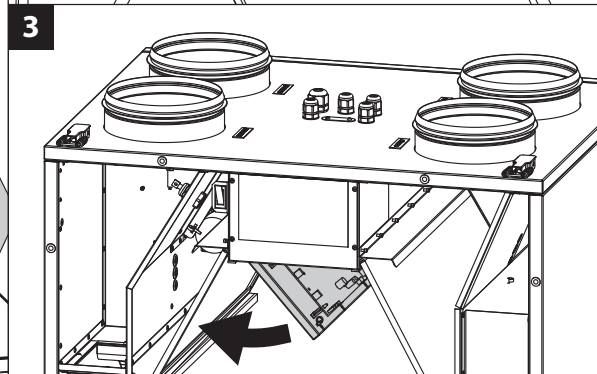
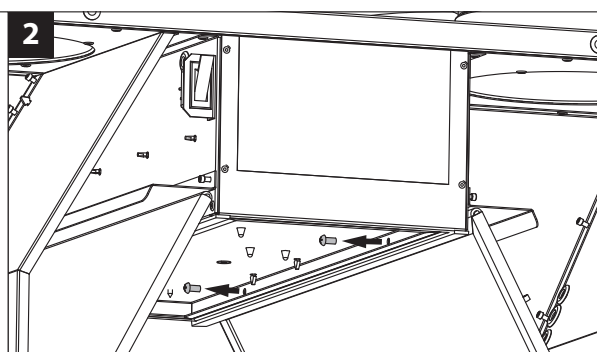
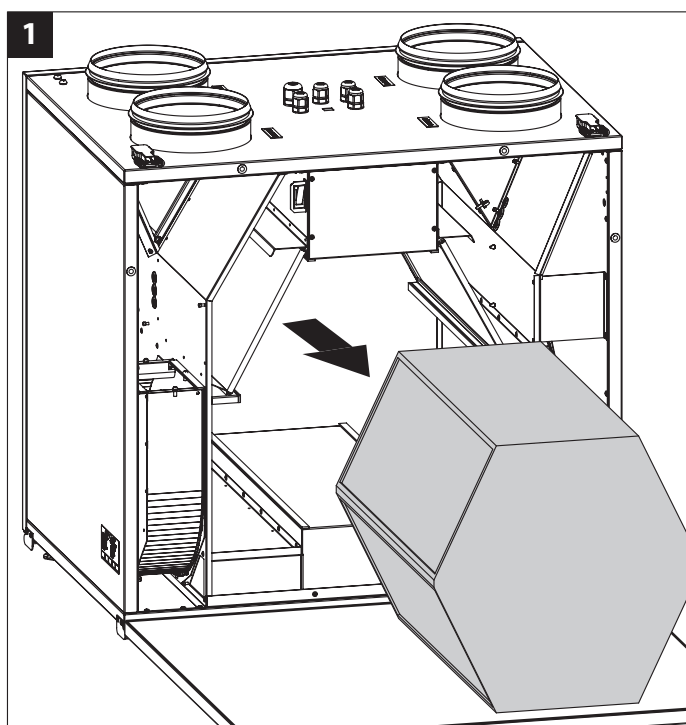
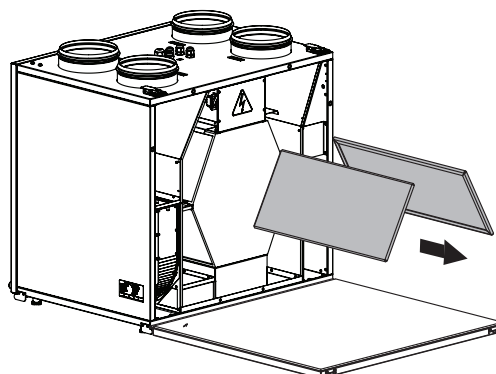
### 5. Ductwork system maintenance (once in 5 years).

Even if you follow all the listed maintenance guidelines, some dust can accumulate inside the air ducts and reduce the unit performance. Duct maintenance means regular cleaning or replacement.

### 6. Control unit maintenance (if necessary).

The control unit maintenance must be performed by an expert qualified for unassisted operations with electrical installations with the voltage up to 1000 V after careful reading of the user's manual.

Access to the control board of the control unit:



## ■ FAULT HANDLING

Problem	Possible reasons	Fault handling
The fan(s) do(es) not get started.	No power supply.	Make sure the power supply line is connected correctly, otherwise troubleshoot a connection error.
Low air flow.	Filters, fans or the heat exchanger are soiled.	Clean or replace the filters; clean the fan(s) and the heat exchanger.
	The ventilation system is soiled or damaged.	Clean the ventilation system components. Replace the damaged components.
Noise, vibration.	The impellers are soiled.	Clean the impellers.
	The fan or casing screw connection is loose.	Tighten the mounting screws of the fans or the casing against stop.
Water leakage.	The drainage system is soiled, damaged or arranged not correctly.	Clean the drainage system. Check the drain line slope angle. Make sure that the U-trap is filled with water and the drain pipes are frost protected.

## ■ STORAGE AND TRANSPORTATION RULES

Store the unit in the manufacturer's original packing box in a dry closed ventilated premise with temperature range from +5 °C to +40°C.

Vapours or particles which can cause corrosion or damage the insulation or connection tightness are not allowed in the storage environment.

Use hoist machinery for handling and transportation to prevent possible mechanical damages of the unit. Fulfil the requirements for transportation of the specified cargo type.

Use any vehicle types for the unit transportation provided that it is protected against mechanical or weather damage.

Avoid any mechanical shocks and strokes during handling operations.



## ■ MANUFACTURER'S WARRANTY

The manufacturer hereby warrants normal operation of the unit over the period of 12 months from the retail sale date provided the user's observance of the transportation, storage, installation and operation regulations.

Should any malfunctions occur during the unit operation due to manufacturer's fault during the warranty period the user is entitled to elimination of faults by means of warranty repair performed by the manufacturer.

The warranty repair includes work specific to elimination of faults in the unit operation to ensure its intended use by the user within the warranty period. The faults are eliminated by means of replacement or repair of the complete unit or the faulty part thereof.

### **The warranty repair does not include:**

- routine maintenance;
- unit installation / dismantling;
- unit setup.

To benefit from warranty repair the user must provide the unit, the user's manual with stamped sale date and the payment document certifying the purchase.

The unit model must comply with the one stated in the user's manual.

**Contact the Seller for warranty service.**

### **The manufacturer's warranty does not apply to the following cases:**

- user's failure to provide the unit with the entire delivery package as stated in the user's manual or with missing component parts previously dismantled by the user;
- mismatch of the unit model and make with the respective details stated on the unit packing and in the user's manual;
- user's failure to ensure timely technical maintenance of the unit;
- external damage to the casing (excluding external modifications of the unit as required for its installation) and the internal components of the unit;
- alteration of the unit design or engineering changes of the unit;
- replacement and use of the unit assemblies, parts and components not approved by the manufacturer;
- unit misuse;
- user's violation of the unit installation regulations;
- user's violation of the unit control regulations;
- unit connection to the power mains with a voltage different from the one stated in the user's manual;
- unit breakdown due to voltage surges in the power mains;
- user's discretionary repair of the unit;
- unit repair performed by any persons not authorized by the manufacturer;
- expiry of the unit warranty period;
- user's violation of the established regulations specific to the unit transportation;
- user's violation of the unit storage regulations;
- wrongful acts against the unit committed by third persons;
- unit breakdown due to circumstances of insuperable force (fire, flood, earthquake, war, hostilities of any kind or blockades);
- missing seals if provided by the user's manual;
- failure to provide the user's manual with the sale date stamp;
- missing payment document certifying the unit purchase.



**FOLLOWING THE REGULATIONS STIPULATED HEREIN WILL ENSURE A LONG AND TROUBLE-FREE OPERATION OF THE UNIT.**



**USERS' CLAIMS SHALL BE A SUBJECT TO REVIEW ONLY UPON PRESENTATION OF THE UNIT, THE PAYMENT DOCUMENT AND THE USER'S MANUAL WITH THE SALE DATE STAMP.**

## ■ ACCEPTANCE CERTIFICATE

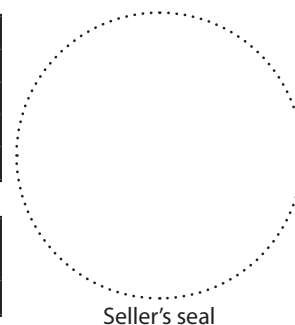
<b>Product Type</b>	Heat recovery air handling unit
<b>Model</b>	VUT____ V__ EC A11
<b>Serial Number</b>	
<b>Manufacturing Date</b>	
is compliant with the technical specifications and is hereby declared ready for service. We hereby declare that the product complies with the essential protection requirements of Electromagnetic Council Directive 2004/108/EC, 89/336/EEC and Low Voltage Directive 2006/95/EC, 73/23/EEC and CE-marking Directive 93/68/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. This certificate is issued following test carried out on samples of the product referred to above.	
<b>Quality Inspector's Stamp</b>	

## ■ SELLER INFORMATION

<b>Shop name</b>	
<b>Address</b>	
<b>Phone number</b>	
<b>E-mail</b>	
<b>Sales date</b>	

This is to certify delivery of the complete unit with the user's manual. The warranty terms are acknowledged and accepted.

**Customer's signature**



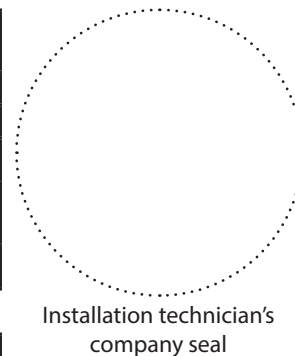
## ■ CONNECTION CERTIFICATE

VUT \_\_ V\_\_ EC A11 heat recovery air handling unit has been connected to power mains pursuant to the requirements stated in the present user's manual.

<b>Company name</b>	
<b>Address</b>	
<b>Phone number</b>	
<b>Installation technician's full name</b>	
<b>Installation date:</b>	<b>Signature:</b>

This is to certify that the works specific to the unit installation has been performed in accordance with all the applicable provisions of local and national construction, electrical and technical codes and standards. The unit operates normally as intended by the manufacturer.

**Signature:**



## ■ WARRANTY CARD

<b>Product type</b>	Heat recovery air handling unit
<b>Model</b>	VUT____ V__ EC A11
<b>Serial number</b>	
<b>Manufacturing date</b>	
<b>Sales date</b>	
<b>Warranty period</b>	
<b>Sales company</b>	



